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THE NATURE AND FUNCTION OF CONTEXT IN COMMUNICATION[1]

H. W. WRIGHT
University of Manitoba

THE psychological importance of communication, now gaining general recognition, raises again a question about *meaning* which has for generations puzzled psychologists. How can meaning be both personal and subjective (which it is), and at the same time be objective—sufficiently so, at least, to be communicated? Fifty years ago, Titchener in trying to banish meaning from the domain of scientific psychology on grounds of its ineradicable subjectivity, then himself showed the impossibility of doing this by offering an untenable explanation of meaning in terms of historic associationism. Behaviourism made a bold attempt to resolve meaning into terms of motor response. An animal, said J. B. Watson, means what it does, and when human animals use speech-forms in communication, the meaning of these symbolic responses consists in the overt behaviour which they, by kinaesthetic conditioning, are able to evoke. Contemporary psychology is indebted to the Gestalt school for supplying a psychologically available concept, that of the *field*, which at least takes account of both the personal and subjective, and the objective and external, aspects of meaning. For the field is, at one and the same time, extended in space, and organized with reference to the goal-seeking activities of the percipient.

When a member of this Association tells a fellow member that he is finding the meeting stimulating, he is no doubt expressing an opinion which is personal and reflects his own subjective feeling. Yet his remark is quite intelligible to his colleague, who knows what he is talking about, the meetings, and what quality he is attributing to them. This central fact, that in talk meaningful experiences are interchanged which, on the one hand, are personal and subjective, and on the other, are objective enough to be mutually understood, should never be forgotten in discussing the psychology of communication. On it depends the salutary effect of communication in counselling. The client is helped, we say, when in the clinical interview he is led to talk freely about his personal troubles, and in this way to give them objectivity. The personal experiences which are exchanged in communication have "meaning" for the communicants, else they would not be impelled to impart them. Since, however, they arise out of the unique life-histories of individuals, this meaning is coloured by subjectivity of

[1]This paper was read at the 1947 Annual Meeting of the Canadian Psychological Association in Ottawa. An earlier paper by this author, published in the June, 1947 issue of the Journal, was incorrectly referred to as being the one read at the above meeting.

origin. Communication removes or overcomes this limitation by making objective and social, experiences which were exclusively individual and subjective. What the psychologist has to investigate are the conditions under which communication accomplishes this result.

On this matter, some psychologists of our own time appear to have held a strange view. This is that when men talk together, they give objectivity to their respective opinions and attitudes by converting them into vocal sounds. Thus we find psychologists writing of the benefits which accrue to individuals from aerating or ventilating their secret fantasies and pent-up emotions in the clinical interview. Of course, such phrases are frequently used in a figurative, semi-jocular, way. Still, their common use does, I think, reflect a view held in some psychological quarters that in communication the feelings and opinions of individuals which are subjective and inaccessible, are rendered objective and observable to others, by being converted into disturbances of the surrounding air. Thus they become physical actualities capable of affecting the sense-organs of anyone within range of their influence. Spearman speaks of the equivocality which infects the term "symbol" when applied to the function of the spoken word or word-image in thinking.[2] It may imply, he says, the view that the verbal symbol means or signifies the object of thought—which is, of course, true. Or else it may imply that the verbal symbol is a substitute for the thought-object—which he dismisses as untenable and even absurd.

While rejecting the extreme behaviourist theory that verbal responses are substitutes for, or are identical with, communicable ideas, we should not overlook the fundamental fact which the behaviourists have brought to our notice. This is that language is an indispensable instrument of intercommunication precisely because vocal sounds are physical occurrences equally external to, and perceptible by, both (or all) participants. Because of this, the forms and patterns of articulate speech can, as we all know, be standardized and made uniform by social convention. Thus it happens that verbal responses, supplemented by expressive movements and directed actions, function as the necessary media for the inter-personal communication of meaningful ideas and feelings. Nor should it be forgotten that behind the words and phrases exchanged in daily conversation lies a common cultural heritage of literary productions, conserved in books and other published writings, available, and more or less familiar, to all who speak and read the language of the group.

Certainly then, language plays a necessary part in giving social objectivity to individual thought and feeling through the processes of communication. But words act only as symbols of meaning. Moreover, unless they possess the same, or very similar meaning for the two participants, they

[2]C. W. Spearman, *The Nature of Intelligence and the Principles of Cognition* (London, 1927), 176.

will be ineffective as media for the transmission of experiences. A common context of meaning is, therefore, a prerequisite of communication, whether by words or expressive movements. Granted that suitable external media (such as spoken or written words) are necessary, what is the nature of this meaningful context shared by the two participants? This is the crux of the psychological problem of communication, since it is a reference to this common context which gives objective meaning to the individual experiences.

A plausible answer to this question is that the common context which gives objective meaning to the words of communicants is supplied by the collection or system of beliefs, points of view, and evaluations which both or all have derived from the social culture in which they have been reared. All individuals, it might be said, have in childhood gradually assimilated the system of beliefs and standards currently accepted in the group of which they are members. Now this answer contains some truth—enough to be definitely misleading in the present connection. How is the young child to gain enough understanding of the socially-accepted beliefs concerning the world and human nature and behaviour to enable him to transcend his early ego-centricity, and take the social point of view, except through the instruction he receives, the explanations, comments, and criticisms he hears from his elders? But all such explanation and enlightenment of whatever sort, whether by word of mouth or by culture-products like books pictures, songs, etc., is itself a form of communication, and presupposes something in the way of a common context of meaning. To suppose that this common context is supplied by the culture pattern whose introception it makes possible, is to reason in a circle. And the fact that the common context develops and comes into effective operation *pari passu* with the gradual assimilation of the accepted system of beliefs and practices may only indicate that both are dependent on a third factor.

Such indeed is the case. With his usual acumen in dealing with the early stages of mental and personal development, Piaget, in his Harvard Tercentenary Address on "Principal Factors Determining Intellectual Evolution from Childhood to Adult Life,"[3] points out what this factor is. In previous writings, well known to psychologists, he had referred to the ego-centricity of the little child which prevents him from taking account of the discrepant perspectives and points of view of other individuals, and had shown that in the course of several years the child overcomes this primitive ego-centricity by adopting realistic modes of thought which allow for, and coordinate, the different viewpoints of others. How is this accomplished? By a process of rational coordination, he affirms, whose essence is found in the logic of relations, i.e. those intellectual operations which establish the reciprocity of individual perspectives and the interconnection of the facts

[3]Cf. *Factors Determining Human Behavior*, Harvard Tercentenary Publication (Cambridge: Harvard University Press, 1937), 32.

of experience. This advance he describes as proceeding simultaneously along two lines, social and intellectual—as he puts it, rational coordination and social coordination go hand in hand. As a result of the social interchange of experiences, the child comes to understand that external objects possess their own distinctive qualities which give them identity and permanence of character, and that these objects follow their own order of causal dependence. On the other hand, just because he gains an understanding of the relationships which organize perceived objects and events into an independent system, he is able to admit, and to take account of, the existence and reciprocity of many varying individual points of view. Thus rational coordination and social coordination are just two aspects of one and the same process.

But, the question may be asked, "Have you done more than refer to the development of conceptual thinking in the child, dependent on his growing powers of abstraction and generalization, and resulting in the formation of general ideas of objects and relations to which are affixed distinguishing verbal labels?" These activities are duly mentioned and described in every psychology text-book, to be sure, but what is the justification for holding that they discover, or constitute, a world both meaningful and real, which functions as an objective, common context in inter-personal communication? Are not the products of conceptual thinking by individuals limited to the mental sphere and, in their way, just as remote from the objective world as are the preferences and prejudices, the convictions and purposes of these same individuals? To this objection it may be replied that the natural world of everyday behaviour is a world of individual perception, but that does not prevent its being an external and objectively meaningful world. This is because sensory experience gives to the perceived world the externality of space, and its structure and organization are determined by the motor adjustments all men must make in order to satisfy their common needs. It is much the same, at least in principle, as what is sometimes called the world of rational discourse. Words, spoken, written, printed, give to this world the external, the physical, actuality it must possess in order to have an existence independent of the subjective experiences of individuals. But verbal responses would be quite useless as vehicles of communication if they did not signify objects whose characteristic properties and permanent relations fit them to be the subject-matter for co-operative thinking, and goals for co-operative pursuit, by the members of human society. Language furnishes the external medium, logical thought constructs the necessary framework, and the joint achievements of men in the different departments of human culture supply the concrete and vital content, of the world of rational discourse, the objective context in personal communication.

THE FREUDIAN DOGMA AS A PROBLEM IN THE CONVENTIONS OF PSYCHOLOGY

DAVID A. STEWART
University of New Brunswick

A pertinent problem long facing the psychologist is the question of the definition, scope, and purpose of his discipline. For psychology, though now respectably acclaimed a natural science, is as much if not more irritated into a statement of its position than, for example, either physics or biology. Men like Jeans, Eddington, Haldane, and Needham have felt obliged to turn philosopher and defend their disciplines against the encroachments of theologians, mystics, and crack-pot atheists and prove to inquirers seeking a knowledge of their work that, when asked what actually they were doing, they could offer an intelligent reply instead of a blank face.

Psychologists likewise, though now emancipated from the tyranny of speculative thought, are expected now and then to satisfy the philosophers as to what their science is and what it purports to do. It is common today among experimentalists and clinicians to hear them insist they are not concerned with value, purpose, or metaphysical assumptions. These things, they say, we have left behind when we moved out on philosophy. But they are rather too firm in their refusal to answer questions of this nature, as if they inwardly suspected that their science had not yet become natural and that even if it had they must sometime furnish a philosophical defence of their work as the physicists and biologists have felt impelled to do.

Freud, pursuing, as he thought, the scientific method in his attack on religion, found himself faced with the need to state a positive substitute for the great gap left in the human mind after the illusion of religion had been scattered. The result is his philosophy of psychology, a fairly explicit statement on the foundation of his inquiries. It seems that the result is much more than an academic play of logic, for the strength of the foundation will be everywhere felt in the structure based upon it. Thus the whole programme of clinical work and of therapeutic methods can be argued to stand or fall on the ideal embodied in the base.

One can agree with Freud that the right of dogmas to be believed has scant support. When we are asked to accept religious dogmas on the ground that our forefathers believed them, that we have been informed of them by our parents, and that finally it is just not good policy to doubt them, we are bound to admit that this is a request we could not grant for beliefs far less important than those of religion. It would be hardly the sort of approach that a man could use in business dealings or that a student could use in solving an intellectual problem. Anything which purports to be reasonable must submit to reasonable inquiry and if it cannot meet this test it deserves to be doubted. At every turn he keeps pressing for authenticity, evidence, and

proof. "The information which should solve for us the riddles of the universe and reconcile us to the troubles of life . . . has the weakest possible claim to authenticity."[1] But it does not seem logical to move swiftly from a criticism of religious doctrine to a criticism of the whole of the religious system. It looks as though Freud would like to apply his sharp rationalism to areas of religion other than its doctrinal form. From his concern with religious doctrine he moves suddenly to the whole complex nature of religion. "The whole of the religious system would become infinitely more credible if one could succeed in this way in removing the element of doubt from a single part of it."[2] At this point one is inclined to question the soundness of Freud's argument if he intends that the whole of the religious system is to embrace content other than doctrines and dogmas. If that is his intention he is being grossly unpsychological for if, as he himself affirms, man's search for God springs from a psychic necessity, then the demand for a strictly scientific proof of something by nature unscientific is plainly illogical. Freud, however, returns to solid ground when he launches his criticism against theologians and philosophers who attempt either to justify the existence of God on the ground that religious doctrine is above reason or because the assumption of God's existence is a useful practical fiction. Freud admits that to believe in God as a personal unreasoned experience is possible and interesting in its proper place, but to parade it as a decree binding on many has no greater force than any other irrational experience. The argument of the philosophers that to act as if God existed justifies belief in Him is obviously a view unbecoming to the best in human dignity. It may be a sound assumption in the practical world as, for example, when William James advises us to act kindly and cheerfully though we may feel the opposite; but to understand God on this pragmatic basis is a device of which only the philosophers could be guilty.

Freud, despairing of any reasonable support for religious ideas, makes it abundantly clear that they draw their strength from their psychic origin. In this criticism of religious ideas he is consistent for he refers only to those of them which are of the nature of dogmas: "These, which profess to be dogmas, are not the residue of experience or the final result of reflection, they are illusions, fulfilments of the oldest, strongest and most insistent wishes of mankind; the secret of their strength is the strength of these wishes."[3]

But when later he warns you "not to deceive yourself into thinking that with such arguments you are following the path of correct reasoning"[4] one is surprised by the warning, for he has already made it clear that the

[1] *Future of An Illusion* (London: Hogarth Press, 3rd ed., 1946), 47.
[2] *Ibid.*, 48.
[3] *Ibid.*, 52.
[4] *Ibid.*, 56.

direction of religion over and above its dogmas moves in paths other than that of correct reasoning. When he goes on to press the need for rational proof, two facts clearly emerge: (a) the inconsistency of his argument, and (b) the unmistakable assertion of the rational dogma "No reasonable man will behave so frivolously in other matters or rest content with such feeble grounds for his opinion or for the attitude he adopts; it is only in the highest and the holiest things that he allows this."[5] Here Freud seeks a single solution to a problem that Hume and Kant have analysed for us as really two problems; the expression of a wish is something qualitatively different from the observation of fact, and it is an error in thought to confuse the two. Bertrand Russell supports Hume and Kant in this view and indeed supports Freud inasmuch as Freud attributes religious matter to wish and desire, but Freud and Russell part company over the problem of value when the former introduces the dogma of reason as equal to problems not only of science but also of value. "A judgment of intrinsic value is to be interpreted, not as an assertion, but as an expression of desire concerning the desires of mankind. When I say 'hatred is bad' I am really saying 'Would that no one felt hatred.' I make no assertion: I merely express a certain type of wish. The hearer can gather that I feel this wish, but that is the only *fact* that he can gather and that is a fact of psychology. There are no facts of ethics."[6] If this argument is sound it is hard to see how Freud can consistently extend his rational dogma over the whole of human thought and action; for example, Freud's ideal of maturity governed by reason is of course a psychological fact, but an ideal of immaturity governed by emotion is equally a psychological fact. To assert either ideal as ultimate is every bit as arbitrary as the most fantastic religious assumption. To say that the ideal of reasoned maturity is true because it is useful and workable in society is to commit the error which Freud himself violently attacked in the philosophy of "as if." To wish that reason should guide human affairs is no more and no less factual than to wish that God or Attlee should do so. We can agree with Freud that as the funds of knowledge increase religious beliefs decline, but that is not to say that increased knowledge will exhaust the meaning of preference, desire, and hope. We can also agree that the best way to control our instincts is through our intelligence, and we are glad, by the way, to note that Freud in the spirit of a good scientist admits that he too may be chasing after an illusion; but we cannot agree with his conclusion that barring the primacy of reason we must return to the thesis that "man is a creature of weak intelligence who is governed by his instinctual wishes."[7] It seems sensible to suppose that we can settle adequately between the two horns of the dilemma, between the primacy of reason and the primacy of emotion. Freud's belief that it must be

[5] *Ibid.*, 56.

[6] Bertrand Russell, *Power; A New Social Analysis* (New York: Horton, 1938), 247.

[7] *Future of an Illusion*, 84.

either one or the other is another instance of his inveterate rationalism. Pushing still further his case for rational maturity he asks: "Is it not the destiny of childishness to be overcome? Man cannot remain a child forever; he must venture at last into the hostile world. This may be called 'education to reality'; need I tell you that it is the sole aim of my book to draw attention to the necessity for this advance?"[8] One doesn't quarrel with the maturity ideal but the terms "hostile" and "reality" immediately come under suspicion, for both imply the imputing of motives to situations that can as easily be assumed to be as indifferent to man's fate as they are concerned with it, so that what one man interprets as "hostile" or "real" may to another mean "genial" or "false" or just nothing at all. This is another instance of the expression of desire or hope rather than of rationally supported fact and the confusion again of scientific fact with the value judgment.

Freud finally reveals himself as the supreme rationalist when he concludes: "No, science is no illusion. But it would be an illusion to suppose that we could get anywhere else what it cannot give us."[9] This surely is the height of dogmatism; after his abundant clinical research in the unconscious and his stress on its meaning in our lives, Freud yet emerges from it all like an eighteenth-century deist untutored in the serious flaws which Hume and Kant had detected in the rational dogmas of their age. It is not that Freud has been too psychological: on the contrary, he has not been psychological enough.

In his later work *Civilization and Its Discontents* Freud is more at home, for here he is concerned with the neurotic manifestations of the sense of guilt. "It faithfully corresponds to my intention to represent the sense of guilt as the most important problem in the evolution of culture, and to convey that the price of progress in civilization is pain in forfeiting happiness through the heightening of the sense of guilt."[10]

But the fact that something harmful arises from a natural psychic necessity is not at all to impugn that necessity itself. Thus, while the therapist recognizes the need to wipe out a neurotic sense of guilt it does not follow that he must eliminate the natural desire that has somehow got misdirected into harmful channels. It is equally hard to see how the use of "good" and "bad" can be avoided in describing what is acceptable or not acceptable in human living. It is by a curious turn of logic that the rational dogmatist, in asserting the primacy of reason, considers it urgent to attack the ethical notions of right and wrong, for in doing so he himself makes a value judgment which is actually to condone the very thing under his attack. "Is there any force so potent and so pervasive that it can do all these things (bad things!) in all civilizations? There is—just one. The only lowest common

[8] *Ibid.*, 86.
[9] *Ibid.*, 98.
[10] *Civilization and Its Discontents* (New York: Horton, 1930), 123.

denominator of all civilizations and the only psychological force capable of producing these perversions is morality, the concept of right and wrong, the poison long ago described and warned against as 'the fruit of the tree of the knowledge of good and evil.' "[11] This view is shared by many psychologists as well as psychiatrists. Every intelligent person can go along with Dr. Chisholm's wish to eliminate the evils whose persistence has led him to make the remark quoted above, just as one can agree with Freud's clear criticisms of the evils of guilt in *Civilization and Its Discontents*. But both Freud and Chisholm would have been more logically acceptable if they had frankly declared that their transvaluation of value was a psychological fact like any other and is supported by an ethical ideal whose selection is no more and no less natural than any wish-fulfilment. The ethical ideal of Freud and Chisholm is that men will learn to be good through reason and science rather than through religion. It would have been big of them to have admitted that they proposed a new ethic—a new view of right and wrong to replace one that is outmoded, rather than to have launched an all-out attack on value systems that were motivated by ethical ideals as well-intentioned and as psychologically grounded as their own. Finally, it might have been admitted that to endow God solely with rational virtue is a dogma based on a bleaker, more unpsychological wish-fulfilment than to endow Him with the capacity to forgive and forget and for a while to be unscientific.

All this seems to suggest that psychology is not yet done with philosophy. Until concepts of value have become scientifically analyzed, enclosed within the objective scope of natural science, psychology will remain a prey to the speculative spirit of philosophy. Only when intimate personal experience and the value judgment come completely under the sway of natural science will psychology escape from philosophy. But it may escape philosophy only to become variously attached to neurology, endocrinology, and statistics.

There is more than academic interest in this question of the conventions of any discipline presuming to be scientific. There is the practical problem of the direction of our scientific and intellectual efforts; after the heat of research has cooled and a science has come of age, it pauses to examine its achievements and to reflect on its aims: Will the clinician and the experimentalist in psychology continue "to leave the heavens to the sparrows" or will they consider it a worth-while task to bring the heavens down to earth? If they do, it is to be hoped they can furnish a sounder argument than has yet appeared for psychology as a mature, self-contained, and well-disciplined science.

[11]G. B. Chisholm, "The Responsibility of Psychiatry" (*Psychiatry*, 9, 1946, 3-11). Brackets mine.

THE EFFECT OF ADDED THIAMINE ON INTELLIGENCE AND LEARNING WITH IDENTICAL TWINS

KARL S. BERNHARDT, MARY L. NORTHWAY, AND CATHERINE M. TATHAM

University of Toronto

It has been shown in a number of experiments (1, 2) that an early deficiency in vitamin B has a detrimental effect on the learning ability of rats. Recent studies by Harrell (3, 4) seem to indicate that a group of orphanage children who were given 2 mg. of thiamine daily showed more improvement on a series of psychological tests than a control group of children who received no thiamine beyond that in their regular diet. The tests used included an intelligence test and a number of tests of learning.

It was thought that a group of identical twins living at home and attending school would provide a suitable group to test this effect further. A search of the Toronto Public Schools was made and 72 pairs of twins thought to be identical were found. Examinations to insure that the twins were uniovular were conducted by Mrs. Reid Weaver under the direction of Dr. Norma Ford Walker of the Department of Zoology of the University of Toronto. Only 53 of the 72 pairs were found to be clearly identical. Eight pairs were rejected for various reasons such as insufficient data and the study began with 45 pairs. For still other reasons nine more pairs of twins were dropped, as there were not complete data. A complete analysis for 36 pairs of identical twins was made.

The group used consisted of 16 female pairs and 20 male pairs. They ranged in age from 7 : 6 to 15 : 7 years with an average age of 11 : 4 at the beginning of the experiment. The children were distributed in all grades from 1 to 9. For 5 of the pairs the two children were in different grades; for 11 pairs, although in the same grade, they were in different class-rooms; for the remaining 22 pairs they were in the same grades and the same class-rooms. Five pairs came from quite well-to-do homes, 28 pairs were from homes of moderately good financial circumstances, and 3 pairs were from poor homes.

Following the initial tests one twin of each pair was assigned to the experimental group to receive thiamine and the other to the control group to receive a dummy pill. Only Dr. E. Chant Robertson of the Hospital for Sick Children who conducted this part of the study, knew which twin received the thiamine. The details of the diet, height, weight, and vision measures are reported elsewhere (5).

Psychological Tests Employed

There were 8 psychological tests used, as follows.

(1) Individual test of intelligence—Revised Stanford-Binet, Forms L and M used alternately.

(2) Test of Reasoning for Grades IV to VIII, prepared by Dr. John Long of the Ontario College of Education. It consisted of 30 problems in each of two forms. Time limit 12 minutes. Forms I and II used alternately.

(3) Reading Tests. (a) Dominion Achievement Tests in Silent Reading for Grades 2 and 3; Vocabulary (Ontario College of Education). Forms A and B used alternately. (b) Gates Reading Survey for Grade 3 to Grade 10; Vocabulary. Forms I and II used alternately. (Teachers College, Columbia University.)

(4) Arithmetic Achievement. (a) Tests for Grade 2 and 3 prepared by Dr. A. J. Phillips of the Ontario College of Education. Forms A, B, and C. There were 50 items in each form. (b) Dominion Arithmetic Test: Fundamental Operations, Grades IV to VIII (Ontario College of Education) Forms A and B.

(5) Test of Rote Memory (Courtesy of Dr. Ruth F. Harrell, Norfolk, Virginia). Lists of unusual words and their meanings and a test of immediate memory following a standard learning period.

(6) Memory for Faces and Names (Courtesy of Dr. Harrell). Learning names for 20 faces. Test for retention; faces given, names to be recalled.

(7) Code Substitution (Courtesy of Dr. Harrell). A test of both speed and accuracy in matching digits to geometrical figures.

(8) Nail Sorting. A test of manual dexterity. Placing three nails head up in each of 100 holes. Two five-minute trial periods on each testing.

These tests were thought to sample a variety of abilities and learning tasks. Care was exercised to ensure adequate motivation, control of fatigue factors, and order of presentation.

Effect of Thiamine on Test Results

The effect of thiamine on the test scores is reported elsewhere (5) in detail. No completely statistically significant differences in gains between the groups were obtained for the psychological tests, although the nail sorting test approached significance as did also the memory for faces and names. These tests might be considered more energy tests than ability tests and possibly more sensitive to the physical effect of added thiamine in the diet.

Twin Correspondence on Test Scores

It may be of some interest to examine the degree of similarity between the pairs of twins on their test scores. It was assumed that identical twins should provide the best possible method of equating groups. The following data may throw some light on this assumption.

Table I shows the mean scores and standard deviations for the two groups. An examination of this table will indicate a fairly close correspondence between the groups on average scores and variability. In most cases the means are less than two points different. It would seem that the use of

identical twins as a method of equating groups for the kinds of tests used is justified.

TABLE I

MEANS AND STANDARD DEVIATIONS OF TEST SCORES

Test	Initial Trial				Final Trial			
	Exper. Gp.		Control Gp.		Exper. Gp.		Control Gp.	
	M	SD	M	SD	M	SD	M	SD
Stanford-Binet	103.64	17.28	104.61	17.22	107.31	15.55	108.97	18.04
Reasoning	13.82	4.37	14.75	4.64	14.96	4.11	15.75	4.36
Gates Vocab.	37.23	13.38	36.43	13.81	36.57	12.83	35.83	12.51
Arith. Achiev.	29.39	19.15	28.75	17.09	33.86	16.44	35.07	17.14
Rote Memory	5.69	3.37	5.31	2.96	7.17	3.95	7.17	4.11
Faces and Names	17.11	4.62	16.81	4.85	8.78	5.12	8.31	5.02
Code Substitution	201.28	80.49	201.36	74.25	211.69	66.52	89.50	17.60
Nail Sorting	82.39	15.47	84.08	16.38	92.92	18.75	206.11	71.95

The average difference on the various tests between the scores of pairs of twins is given in Table II. This material provides further evidence of the close correspondence in scores of identical twins on the tests used.

TABLE II

AVERAGE DIFFERENCES IN SCORES OF TWINS

Test	Initial Trial		Final Trial	
	M. Diff.	Range of scores	M. Diff.	Range of scores
Stanford-Binet	4.0	79 - 158	5.3	80 - 162
Reasoning	2.4	6 - 24	2.4	8 - 25
Gates Vocab.	4.4	13 - 62	4.8	17 - 65
Arith. Achiev.	4.6	5 - 74	5.9	9 - 71
Rote Memory	2.1	3 - 20	2.7	1 - 20
Faces and Names	2.3	1 - 12	2.5	2 - 18
Code Substitution	23.1	72 - 394	34.9	63 - 414
Nail Sorting	9.5	53 - 121	8.9	58 - 128

Conclusions

1. Thirty-six pairs of identical twins, one member of each pair in the experimental group and the other in the control group provided an adequate method for testing the effect of 2 mg. daily of thiamine for four and a half months on the scores of various psychological tests.

2. The twins showed a high degree of correspondence in performance on these tests at the beginning of the period and also at the end of the four-and-a-half month period.

3. The only gain in scores which could be attributed to the added thiamine was in manual dexterity and retention of faces and names associations. Even in these cases the differences are not completely statistically significant.

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STUDIES IN INTERNATIONAL MORSE CODE

VI. Speed Calculations for International Morse Code

JOSEPH E. MORSH and A. F. B. STANNARD
CAORG Det., A-7 C.S.T.C.

It is difficult to apply any precise procedure for the calculation of the speed of International Morse Code. This is true since any method, at some stage, involves approximation. A detachment of the Canadian Army Operational Research Group at the Canadian Signals Training Centre has studied various systems suggested and has devised a simplified method of calculating and expressing code speeds. This will be described in detail in later paragraphs.

Since commercial telegraphy is operated for financial return and since both machines and operators have definite limitations as to maximum rates, it becomes necessary for commercial interests to determine the speed of transmission that can be maintained for any type of material. Thus the telegraph companies have worked out a practical method that results in the expression of transmission speeds in terms of words per minute. Direct calculations are made to establish rates of charge that, on a time basis, will give equal returns for all types of material.

The code instructor, on the other hand, is not concerned with the paying rate of machines or operators but he is vitally interested in the comparative difficulty of different types of material. He wishes to know, for example, whether an operator who can receive "plain language" at 16 words per minute is as proficient as another operator who can receive mixed number and letter cipher at 12 words per minute. From the instructor's viewpoint the time actually taken to transmit an amount of material, whatever its type may be, is a point of secondary importance, his primary concern being the level of proficiency required to send or to receive the material.

In order to discuss speed calculation it is necessary that certain terms be defined.

Different Morse Code characters vary in the length of their sound patterns. The shortest interval of sound or of silence used is equal in duration to the code character for the letter "E," a single "dot." This interval is known as a "baud." It is the basic unit of code. A "dash" is three "bauds" in length. The spaces between the component dots and dashes of a character are each one baud in length. Thus the code signal for the character "F" is of 9 bauds duration.

Sounds	dot	dot	dash	dot		F
	—	—	——	—		
	1	1 1	1	3	1 1	
Bauds			9			

The code signal for the character "X" occupies 11 bauds.

Sounds	dash	dot	dot	dash	X
	—	—	—	—	
	3	1 1 1 1 1		3	
Bauds	11				

The absolute time duration of the baud is variable. The baud is not a unit of time but a unit of code.

It has become general practice to refer to code transmission speeds in terms of "words per minute." In order to make the expression meaningful it is necessary that a "word," as a unit of transmitted material, be strictly defined. This unit in commercial telegraphy is the word PARIS which contains 5 letters, or characters, and 31 code units or bauds. The choice of this standard word is justified on the basis that an average word of English language contains approximately 5 letters which contain approximately 31 bauds of character material.

It should be noted that with language changes the truly average word varies. However, once having been established and adhered to, any word would prove satisfactory as a unit of measurement.

In order to convey intelligence by means of code it is usual to transmit groups of characters. In "plain language" these groups form words, while in cipher the groups commonly consist of 5 characters. In either case, in addition to the one baud between the component dots and dashes of the characters, two other types of silent space must be introduced. These spaces which exist between characters and between groups of characters must be distinguishable. This is the only requisite as to their time duration.

Individual operators vary greatly in their sending of letter spaces and group spaces. Commercial telegraphers have adopted a letter space of 3 bauds in length and a group space of 5 bauds. In military operations the use of any individual style is discouraged for reasons of security. Hence in training operators for the armed forces the development of a highly uniform ratio of letter space to group space is stressed. The Canadian Army has adopted the commercial 3:5 letter space to group space ratio. The United States Signal Corps uses a 3:7 ratio.

The spacing ratio has a direct bearing on the baud content of the standard word PARIS. Transmission of the word PARIS involves 5 characters, 4 letter spaces and 1 group space. Since a group space always marks the end of a word or cipher group, it is considered to be a part of the preceding word or group. Thus when 1:3:5 spacing (character component space: letter space: group space) is used, PARIS requires 48 bauds per transmission:

P	A	R	I	S	P
— — — —	— — —	— — — —	— —	— — —	— — — — —
3	3	3	3	5	

48

When a 1:3:7 spacing ratio is used PARIS requires 50 bauds per transmission:

P	A	R	I	S	P
— — — —	— — —	— — — —	— — —	— — — —	— — — —
	3	3	3	3	7

50

In commercial telegraphy the calculation and expression of code speeds is relatively simple. Present practice, based on automatic keying equipment, is to speak of keying speeds in bauds per second. For 1:3:5 spacing, 48 bauds is equal to one PARIS word so the conversion factor from bauds per second to words per minute is $\frac{60}{48} = 1.25$. Thus a keying speed of 16 bauds per second is equal to 16 x 1.25 = 20 words per minute. In commercial practice, keying speeds below 16 bauds per second (20 WPM) are seldom used. The 1:3:5 ratio is maintained and the speed of transmission is increased or decreased by varying the keying speed, thus changing the time duration of the baud unit.

In military training a factor of complication arises. It is difficult to teach code to beginners at 20 words per minute. Speeds of 4 words per minute are commonly used at the beginning of instruction. If the 1:3:5 ratio were to be maintained at this low rate the individual characters would be very slow and drawn out, the sound pattern being changed. It has been found advantageous to maintain the character or keying speed at 20 words per minute and to increase the lengths of the letter and group spaces to obtain slower training speeds. The student thus learns to recognize the code character as a complete sound pattern which, below 20 words per minute, remains the same irrespective of the speed of transmission.

It is accepted practice in Canadian and American training centres to maintain the 20 word per minute character speed at all rates below 20 words per minute and to maintain the 1:3:5 or the 1:3:7 ratio at speeds above 20 words per minute. This means, in effect, that above 20 words per minute, speed is varied directly by changing the keying speed, i.e., the length of the bauds, but that below 20 words per minute the keying speed remains constant and the 1:3:5 ratio is changed. Ratio of 3:5 between letter spaces and group spaces (e.g., 1:9:15, 1:15:25), however, is maintained wherever possible.

Holding the character speed (keying speed) at 20 words per minute means that the baud becomes a fixed time unit and that there are 960 bauds in one minute:

$$20 \text{ (words)} \times 48 \text{ (bauds)} = 960 \text{ bauds}$$

Thus automatic telegraph equipment, adapted for training purposes, is set to run at a fixed rate of 960 bauds per minute.

If a letter space to group space ratio of 3:7 is used, PARIS contains 50 bauds and becomes unsatisfactory for a standard word since an even number of PARIS words cannot be transmitted at the 960 baud per minute rate. For this reason several new standard words have been proposed in the United States where a 3:7 ratio is maintained, the requisite for these words being that together with spacings they contain 48 bauds. Among words suggested are: BOISE with 29 bauds of character material and 19 bauds of space, and WORN with 32 bauds of character material and 16 bauds of space.

Army transmissions utilize various types of cipher. To be consistent it might appear that the standard word PARIS should not be used for cipher where the average group may contain say 50 bauds of character material. To this end certain authorities have proposed standard words for each type of material. This report, however, will present a somewhat new concept of speed, and it will be seen that the use of a single word base for all materials is advisable.

Instructors have a tendency to consider all equal word-per-minute speeds to be more or less of equal difficulty. If speeds are based on calculations from material content, then different types of material transmitted at the same word-per-minute rate may differ greatly in letter- and group-space durations. In a like manner different types of material, transmitted with identical character speed and identical letter and group spacings may, due to differences in the length of the characters, pass different numbers of words or groups per minute. However, the difficulty factor has never been shown to be a direct function of the material content. If anything, difficulty depends upon the apparent speed which is a function of the summation of the intervals of decision, i.e., the letter and group spaces. During the time interval between the cessation of one character and the start of the next character the listener must make a decision as to the identity of the preceding character. This is true for all letter spaces. During the time interval of a group space a decision must be made as to the identity of the preceding character, and the existence of the group space as a termination of a word or cipher group must be recognized. There also seems to be some indication that part of the group space, at least at low training speeds, is utilized in mental recall and verification of the sound patterns of the preceding group.

It would appear that it is much more justifiable to consider speed as an inverse function of the letter and group spacing summation than to consider speed as a function of the character material. If this assumption is accepted it makes possible extensive simplification of speed calculations for machine tapes. Speed, expressed in PARIS words per minute, then becomes entirely a function of the letter and group spacings irrespective of the material being transmitted. Thus, when a definite speed in words per minute is referred to, one, and one only, spacing summation is indicated. When the letter space

and group space remain constant the word-per-minute rate will be the same for all types of material.

A character speed of 20 words per minute is maintained for all transmission speeds of 20 words per minute or less. For any given spacing, the speed in PARIS words per minute is defined as the number of times that PARIS, with this spacing, can be sent in one minute. Since the character speed is fixed at 20 words per minute there are 960 bauds per minute. There are 31 bauds in the characters of PARIS plus 4 letter spaces (LS) and one group space (GS).

Thus:

$$\text{Words per minute} = \frac{960 \text{ bauds}}{\text{Bauds in PARIS chars.} + \text{bauds in PARIS spaces}}$$

or

$$\text{WPM} = \frac{960}{31 + (4\ \text{LS} + \text{GS})} \qquad (1)$$

It can be seen from Equation (1) that the only variables relating to speed are LS and GS. Thus the speed in words per minute is expressed as an inverse function of the space summation.

If an LS:GS ratio of 3:5 is maintained, then:

$$\frac{\text{LS}}{\text{GS}} = \frac{3}{5} \qquad (2)$$

The appropriate Wheatstone tape spacings for any word-per-minute speed may be calculated by solving Equations (1) and (2).

Above 20 words per minute the 1:3:5 ratio is maintained. Thus the bauds of PARIS characters plus the bauds of PARIS spaces become a constant of value 48. The keying speed is varied to produce different speeds in words per minute.

$$\text{Keying Speed (in bauds per minute)} = 48 \times \text{WPM} \qquad (3)$$

For cutting Wheatstone tapes, the relationship between bauds and tape centreholes may be expressed:

$$\text{Centreholes} = \frac{\text{Bauds} - 1}{2}$$

Equation (3) may be approximated:

$$\text{Keying Speed (in centreholes per minute)} = 24 \times \text{WPM} \qquad (4)$$

Equation (3) or (4) may be solved to obtain the correct keying speed for any desired speed in words per minute.

When material is to be transmitted by hand or when it is wished to check the speed of received code, the only method of obtaining an estimate of the spacing summation is to perform a timed character count. From this may be obtained the rate of transmission in characters per minute. In this case, the type of material being transmitted must be known in order to make

an estimate of the spacing. In plain language text the number of bauds of character material in the average word is 31. The number of bauds is greater in 5-character groups, equal frequency letter cipher, and considerably greater (more than double) in 5-character group, equal frequency number cipher. In consequence of this difference in character content it is apparent that the speed in characters per minute of plain language will not be equivalent to the speed in characters per minute of cipher given at the same word-per-minute speed, i.e., with the same letter spaces and group spaces.

The number of characters constituting a word in plain language is extremely variable. For the purpose of speed calculation by character count, the average is taken as 5. Thus for plain language, the number of characters counted per minute is divided by 5 to give the speed in words per minute.

Speed calculation of 5-character cipher group by character count may be made by means of formula (5) below.

The following notation will be used:

Characters counted in one minute ..... CPM
Average number of bauds in the characters in one group of the type of cipher being transmitted ..... Bc
Bauds in the characters of PARIS ..... Bp
Bauds in the spaces of PARIS ..... Bc

Let $Bc - Bp = C$

Then for a keying speed of 20 words per minute (960 bauds per minute)
For 5-character groups

$$\text{Groups per minute} = \frac{960}{(Bp + Bs) + C}$$

For 5-character groups

$$\text{Characters per minute} = \frac{5 \times 960}{(Bp + Bs) + C}$$

$$\text{Therefore } (Bp + Bs) + C = \frac{4800}{CPM}$$

$$\text{But words per minute} = \frac{960}{Bp + Bs}$$

$$\text{Therefore words per minute} = \frac{960}{\frac{4800}{CPM - C}} \quad \ldots\ldots\ldots\ldots (5^1)$$

It will be noted that for plain language $C = O$ and Equation (5) reduces to

$$\text{Words per minute} = \frac{CPM}{5}$$

The quantity C varies for different types of cipher.

[1]Equation (5) may be made general for any length of cipher group by substituting the expression (960 x characters per group) for 4800.

For equal frequency 5-character letter and number cipher.....
.....C = 18.17;
For equal frequency 5-character letter cipher.....
.....C = 10.15;
For equal frequency 5-character number cipher.....
.....C = 39.00.

When the solution of Equation (5) gives a result in excess of 20 WPM the basis of Equation (5) breaks down, since the 20 WPM character speed cannot be maintained. The 1:3:5 ratio is then maintained and the keying speed raised. Thus if a character count is performed when a 1:3:5 ratio exists the rate in PARIS WPM of any type of cipher is proportional to plain language characters coming at that rate times a constant factor of

$$\frac{\text{Bauds in cipher group} + \text{bauds of spaces}}{\text{Bauds in PARIS} + \text{bauds of spaces}}.$$

When a 1:3:5 ratio is maintained the average number of bauds per cipher group plus associated spaces is as follows:

Equal frequency letter and number cipher.....66.17
Equal frequency letter cipher 58.15
Equal frequency number cipher 87.00

Thus:

For equal frequency letter and number cipher

$$\text{WPM} = \frac{\text{CPM}}{5} \times \frac{66.17}{48} = .276\ \text{CPM} \quad \ldots\ldots (6)$$

For equal frequency letter cipher

$$\text{WPM} = \frac{\text{CPM}}{5} \times \frac{58.15}{48} = .242\ \text{CPM} \quad \ldots\ldots (7)$$

For equal frequency number cipher

$$\text{WPM} = \frac{\text{CPM}}{5} \times \frac{87}{48} = .363\ \text{CPM} \quad \ldots\ldots (8)$$

The WPM rate of any of the types of material discussed may be obtained from a character count by solving the appropriate equation, (5, 6, 7 or 8).

Equations 5, 6, 7, and 8 are plotted in Figure 1. Character counts may be interpreted directly from this figure.

When random numbers or number groups occur in plain language texts the material cannot accurately be called plain language. Neither does it fall under any of the above mentioned types. In this case a fairly accurate speed interpolation may be obtained from Figure 1 as follows:

(a) By a character count determine the transmission rate in characters per minute.

(b) Calculate the percentage occurence of numbers in the text. For example, 15 numbers in a 300 character text gives

$$\frac{15}{300} \times 100 = 5\%\ \text{numbers}$$

(c) On Figure 1, follow the vertical line from the determined value of characters per minute until a point of the appropriate number percentage is reached. Number percentage departure curves are identified on the

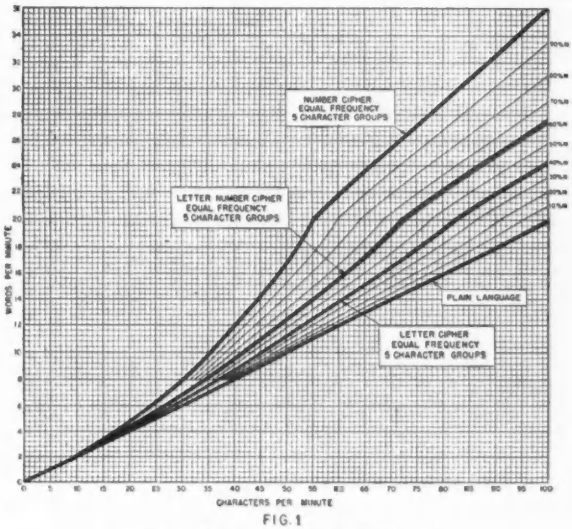

FIG. 1

WORDS PER MINUTE BY CHARACTER COUNT

right-hand ordinate of the figure. The speed in WPM is then read from the left-hand ordinate scale. Values of number percentages that lie between the plotted curves may be interpolated.

Example:

The following text is received in a total time of 100 seconds:

BY MARCH 1945 THERE WERE 123 LARGE GROUPS IN THE 6 PROVINCES REPRESENTING A TOTAL OF 16550 WORKERS IN THE 263 PLANTS

Number of characters = 95

Number of numbers = 16

$$\text{Percentage numbers} = \frac{16}{95} \times 100 = 16.8\%$$

$$\text{Character rate} = \frac{95 \times 60}{100} = 57 \text{ characters per minute.}$$

The vertical line from 57 on the characters per minute scale is followed until an interpolated point of 16.8% is reached on the number percentage curves. A value of 12.1 WPM is read from the WPM scale.

Conclusions

In training Morse operators, low rates of speed are usually used. This raises problems in speeds and spacings not normally encountered in commercial telegraphy. The solutions proposed in this report are summarized below:

(a) Speed of transmitting Morse Code is to be considered as an inverse function of the summation of the spaces between characters, irrespective of the transmitted material.

(b) Speeds are to be measured in words per minute with PARIS as the only standard word.

(c) Above 20 WPM the 1:3:5 ratio is to be maintained.

(d) Below 20 WPM the 20 WPM character or keying speed is to be maintained and the LS:GS ratio kept as close as possible to 3:5.

THE MEASUREMENT OF INTEREST[1]

LAWRENCE T. DAYHAW
University of Ottawa

PSYCHOLOGISTS are gradually getting around to the measurement of new aspects of human behaviour. When eminent leaders, such as Binet for intelligence, Thorndike for learning, etc., had blazed the trail and opened up new avenues of research, they were gratified to see scores of ardent workers carry on the exploration they had pioneered. New discoveries, numerous verifications, better measuring instruments are now some of the tangible results. Quite a cheerful outlook, to be sure. However, the situation has its cheerless aspect. A careful observation of the historical advancement in psychological measurement will lead to the conviction that, like so many other expressions of human activity, research work tends to follow the beaten path, that it is entrenched in deep ruts, that it prefers the familiar field to new horizons.

Any layman when asked to quote the important qualifications for a particular calling in life would not fail to mention some ten to twenty human traits, very few of which could be measured in the present status of our psychometrics. One must now be satisfied with very indirect measures for such things as will-power, discretion, diplomacy, co-operativeness, leadership, etc. A standing call exists for research leaders in the many directions glaringly pointed out by our multiphasic human personality.

Fortunately, that aspect of human striving called interest is now well on its way toward greater clarification and better measurement. It is the purpose of this paper to call attention to the fact.

For the most part, psychologists at first only toyed with the concept. Educators had built up educational systems irradiating out of interest-loaded centres, but psychologists in their earlier experimental studies showed no great concern for guiding principles. Everything seemed to depend upon the particular technique which was readily available for gathering data. Lists were compiled of children's interests in games, in reading material, in radio and movie programmes, in comic strips, etc. Even in more recent years investigators have ignored integration with other traits of behaviour. A few exceptions exist; but as a rule interest has been studied almost for a *sui generis* value.

It is in the field of guidance and selection, either vocational or educational, that the measurement of interests is now making its greatest contribution. Clinical psychology may soon emulate human engineering in this respect. It was in the field of guidance that somebody finally stressed the fact that interests are determining factors of human behaviour. Bingham gives four reasons for attempting to measure an applicant's vocational interests: (1) "To find out whether he will probably like to do the work of the occu-

pation in question." (2) "To ascertain whether the personal relationships within the occupation will probably prove congenial." (3) Because "more often than not, a person can learn to do best what interests him most." (4) To draw a person's attention "to possible fields of activity which might otherwise be overlooked."[2]

Obviously, careful studies of the variable called interest had to be made before any faith could be placed in its value for prediction, before laborious proceedings were undertaken for its measurement.

An early challenge to interest-test constructors was to establish whether groups of individuals could be segregrated on the basis of their interests. Discrimination has long been synonymous with validity in tests. It is one thing to measure a lawyer's interests; it is another to know whether these interests are characteristic of the legal profession. Or again, it is all very well to assume that carpenters and real estate brokers find their satisfaction in different fields; but it would be reassuring to establish in a lemma that the pattern of interests is both universal in either calling and at the same time clearly distinct from that of the other calling. Freyd, Cowdery, and Strong set themselves to the task of finding this out.

Freyd began by endeavouring to differentiate jobs on the basis of either social or mechanical interests.[3,4,5] His procedure was cleverly designed. But after retaining the items with good discriminatory value for his two standardization groups, he found to his dismay that no such discernment was created for subsequent groups. Was it because neither mechanical nor social interests were clearly defined in the groups of people he used? Was it because although such differentiating interests might exist, his test did not tap them? Was it because the items in his test distinguished his first subjects not so much with respect to the professions to which they belonged as with respect to some other subtle grouping in which, as individuals, they chanced to fall?

Cowdery adopted a more fruitful approach.[6] He selected items discriminating between physicians, engineers, and lawyers, without any assumption as to the nature of the three patterns of interest. His method consisted in contrasting percentage frequencies of likes or dislikes for any one group with those of the other two pooled together and in sifting out just those items that show a significant difference in such percentages. The results were quite encouraging: the method has proven successful.

Then Strong used it to still greater advantage when he first compared eighteen professions involving 1,271 individuals and later sixteen professions involving 2,944 individuals.[7] Naturally, the standardization subjects were well identified on the basis of their measured interests; but most gratifyingly so were other subjects to whom the test was later given. Strong's 1938 revision of his *Vocational Interest Blank* provides scoring keys for some forty occupations, six occupational groups, twenty-one skilled trades,

and four non-occupational features; also for interest maturity, masculinity-femininity, occupational level, and studiousness.

A second source of hesitation had bothered the minds of test makers. How permanent are a person's interests? Do they come and go, or do they stay with the individual for some length of time, long enough at any rate to condition later interests? The literature teems with investigations on this important issue. Young people's interests were scrutinized in every respect: age, school level, sex, time interval, interest trends, requirements on abilities, amount of shift in vocational positions. To sum up a long story, the degree of resemblance of vocational interests over various periods of time turned out to be significant.

Research was confronted with a third problem, that of the relationship between interests and ability. Indeed, which is desirable, high correlation or low correlation? Since aptitude tests, which presumably measure potential ability, are valid only to a moderate extent, the addition of interest measurements aims at improving prediction methods. Would this improvement be better helped by high correlation or by low correlation? Before settling the issue as to what should be, research set to work to find out what is, and reported the following: (a) With regard to occupations, correlations between abilities and estimated interests are of the order of magnitude usually found with various mental functions; they are rather low, insufficient at any rate to predict one from the other. When inventoried interests, those measured by tests, were substituted for subjectively estimated interests, the correlations sank still lower, becoming at times almost negligible. (b) With regard to educational subject-matter, the story is much the same. Estimated interests were correlated against abilities, these being rated either by the student himself, or by his teachers, or by his school grades. The correlations oscillated roughly between .30 and .60. These somewhat higher correlations could partially be explained on the ground that in school work, ability and achievement are rarely segregated for measurement.

Summing up, it would seem safe to assert that interests and abilities are too loosely correlated to justify prediction of one on the basis of the other. Some popular publications still continue to claim that interests can be measured indirectly through studies of abilities. This stand is quite plausible; but like a few other logical or so-called common sense "truths," it is not confirmed by experimental verification.

All this, of course, concerns ability. Success or achievement is another matter. Factor analysts will some day identify the components of success. In the meantime, many empirical findings lead us to believe that two of these components will be ability and interest. When standardized interest inventories were added to the counsellor's kit, it became evident that prediction of achievement was sizeably improved. This statement is justified by the results of studies such as that of Hartzell and Murphy using the Cleeton

test for cosmetologists,[8] that of Congdon using the same Cleeton test for student teachers,[9] that of Strong using his own scale for life insurance salesmen.[10] Congdon concluded that measured interests were as valuable as intelligence scores for predicting success in student teaching. Turning from occupational to academic success, a similar conclusion was reached by the many investigations that have specifically considered school achievement.

Such being the case, if both ability and interests are appreciably correlated with success but only slightly correlated with each other, we are confronted with the ideal situation usually hoped for in test batteries. Abilities and interests have an independent contribution to make toward prediction of achievement.

Obviously vocational choice is based on many factors other than interest: factors such as intelligence, school achievement, quite a variety of personality traits, clear-cut attitudes, opportunities, etc. The potency of some of these factors has already been investigated, while for others, such as certain personality traits and attitudes, the field is still wide open for research.

The two issues of permanence of interests and of the relationship between interests and abilities are thus sufficiently clarified to justify the time and labour spent on developing measuring instruments. Already the field of interests can boast of a wide variety of gauges and calipers. A cursory description of these will reveal the clever strategems psychometricians have devised for rating such a seemingly intangible subjective variable.

A first group of tests are of the *information* type. They aim at measuring the extent of the subject's knowledge in any given occupational field. The underlying assumption is that the greater a person's interest in any particular field of activity, the more likely will he be to have acquired specific information therein. Gauging mental traits via information and knowledge applies to many other areas of human measurement: moral behaviour, honesty, trades, social behaviour, etc. The method is valid to the extent that information correlates with the trait to be evaluated. Actually, the correlations are neither very high nor hopelessly low. The idea at the back of all this was sound, but the task at hand was a heavy one. For instance, for a general interest information test, a huge sampling job of all important interest objects was the prerequisite. Quite an imposing task, that only Robinson had the fortitude to undertake with some degree of success.[11] Even in specific fields, like mechanical pursuits, the burden was of the same sort and still quite overwhelming. It is a credit to O'Rourke and Toops that they overcame the difficulty to some degree and provided the instruments known as the *O'Rourke Mechanical Aptitude Test, Junior Grade,* and the *Army General Trade Interest Test.* Information tests have high reliability. The same can not be said for their validity. The correlations with estimated interests are very low, almost negligible; they are somewhat higher with estimates and measures of success.

A second approach was made through the process of *free word associations*. Wyman's test is the outstanding example of the method.[12] Her test contains 120 stimulus words. During the process of validation, the stimulus list was repeated to many subjects in carefully chosen criterion groups and all the associated words were tabulated, a total of some 13,000. Each associated word was given three weights according to its discriminatory power between "with" groups and "without" groups for intellectual interests, social interests, and activity interests. Therefore a total of 120 scoring keys, one for each stimulus word, accompany the test. I have great admiration for the industry and patience required. Later validation procedures have given promising, if but tentative, validity coefficients.

A third method of interest measurement has to do with *learning*. Burtt relied on the assumption that one learns more easily that which is of greater interest.[13,14] For his test, each individual gets a score which is the ratio of learning items of specific interest (in his case agricultural engineering) to learning items of wide general interest. The ratio technique was designed to eliminate to some extent individual differences in learning. Unfortunately his underlying assumption has never been proved experimentally.

A fourth procedure involves resistance to *distraction*, founded on the hypothesis that distractability will be lower for interesting material than for other material. Burtt who followed this path saw more future in it than in his other method.[13,14] However, the technique has to be perfected to control such other factors as motivation.

Quite a variety of other methods were resorted to, such as those that check preferences for popular magazines,[15] vocabulary,[15] collections,[16] books that were read,[16] plays and games.[17]

Tests that have appeared within the last decade or so have explored a number of other hypotheses, some of which should be mentioned. (1) Strong's inventory was constructed around the central idea that the likes and dislikes of good workers in a given occupation will group themselves into a definite *pattern* not found in any other occupation. (2) Kuder's *Preference Record* springs from the concept that preferences for *types of activity* have vocational significance. (3) Allport and Vernon stress *evaluative attitudes*. (4) Several tests embody the concept that interests determine *educational choices*. (5) Some tests originated with the idea that interests are expressions of *affective* attitudes relative to ownership, activities, personal features, etc. (6) With Remmers and with Silance, *attitudes* themselves are taken as indications of interest.[18]

If attention is now focused upon the *structure* of the tests, it becomes apparent that this also is polymorphous. A very common form is the check list for likes, for indifferences, and for dislikes. A second procedure is that of showing perference between two opposite choices. A third, like Kuder's, indicates the best-liked and also the least-liked, among three alternatives

Order of preference for several statements is still another technique. A fifth device, added by Strong, contains methods for rating one's own attitudes.

One could categorize all interest tests in still another respect, that of the particular fields of interest in which measurement was attempted. A very wide variety obtains from this point of view. For instance, while Kuder carries measurement along nine dimensions of interest, namely, the mechanical, computational, scientific, persuasive, artistic, literary, musical, social service, and clerical, Allport and Vernon prefer the theoretical, economic, aesthetic, social, political, and religious. The list is unique for practically every author. Strong's exploration runs along the lines of likes and dislikes for occupations, for school subjects, for amusements, for activities, and for peculiarities of people, order of preference of activities, comparison of interests between two items, and rating of present abilities and characteristics. Brainard asks five questions about each of twenty types of pursuits and then requires one to underline objects of interest in ten other groups of activity. Cardall rates for five sorts of business work. Lufburrow's device aims at locating work interests in terms of eleven wide areas. And so on all down the list of tests.

One aspect of interest measurement that attracted many psychometricians into the field was the clever variety of *scoring schemes.* Ever since Ream exploited Yule's equation for evaluating the significance of a percentage difference, statistical formulas have succeeded one another, varying in degrees of complexity or simplicity, discriminatory value, usability, and effectiveness.[19] New techniques will inevitably arise. They will evolve from scratch or carry over from other fields, possibly from personality and from attitudes measurement. Strong's weighting system is both ingenious and effective: it has the unfortunate drawback of being both laborious and expensive. Incidentally, Guttman's technique called "scale analysis" has been profusely employed in the American Army; it might turn out to be of value in interest measurement.[20]

A good deal of attention has also been directed toward the study of a number of subsidiary problems. Is *age* as important a factor as it is commonly assumed to be? Strong's careful study concludes that age differences carry less weight than occupational group differences.[21] Other investigations yield the information that interest scores for high school students are almost as reliable as those of older subjects; encouraging findings indeed for those psychologists who work with high school and college populations.[22]

Sex comparisons tell quite a different story. Several studies found that men's scores were significantly higher for science categories; while women's best interest scores took a diversity of directions: language, people, art, male-association, social service.[23]

Very little is known concerning *family* resemblances in interest. Identical twin resemblance ($r = .50$) appears lower for interest than for intel-

lectual functions.[24] Resemblances of fathers and sons seem to be quite comparable to those of fraternal twins: $r = .28$.[25]

Still other environmental factors have been examined for their possible relationship with vocational interests. *Attitudes* in particular appear to have special significance.[26] Negativism and ignorance have something in common. Vocational preferences can seemingly be cultivated and directed. *Hobbies*,[27] reading ability,[28] and intelligence[29,30,31] have likewise been studied.

Using Strong's intercorrelations, Thurstone applied the factor analysis technique to interests measured by eighteen occupational scales and arrived at four main *components:* interests for science, for language, for people, and for business.[32] These findings are of importance in that they may redirect scales and scoring toward such group factors. Incidentally, group scales will in no way preclude the utility of specific occupational scales. In fact, the group scale can be used as a first step to diagnose a person's broad field of interest. Then specific scales take over for finer differentiation.

This bird's-eye view of interest measurement, despite its brevity, suffices to give some indication of the extent of the work already carried out by psychologists in this field, and of what has been accomplished to date with regard to theoretical information and practice.

In so young a field of specialization, it would be naive to expect a degree of decisiveness not encountered even in much older disciplines. We need not be surprised that as yet all is not perfect, that some constructive criticism can be and is addressed to these deserving research workers with respect to their new rating devices. Particularly prominent in the collection of tests stands Strong's *Interest Inventory Blank* with its four hundred items and its many scoring keys for specific occupations and for groups of occupations. The instrument is a good one; yet serious criticisms warn the user against an exaggerated confidence in it. Moore claims, (a) that such a scale is time-consuming; (b) that too deep a faith is placed in the permanence of interests when we rely on the identity of the interest pattern of an adolescent in his teens and that of a man in his fifties as an indication of occupational success; (c) that the scales do not give sufficient weight to an absorbing interest; (d) that interest patterns are given in terms of debatable specificities and not in general terms.[33]

A fundamental difficulty with all scales arises from the possibility of sampling errors. How were the items selected for inclusion in the tests? It is often a long process. At first, some items were picked as wisely as possible. Later experimentation added more items and dropped those of smallest discriminatory power. This process of adding new material and of eliminating the unfit went on, by trial and error, for over twenty years. It does not seem that anybody ever set to work to explore the entire field of objects of human interest, to group them into significant categories, to cull representative samples. Might it not be that some of the most characteristic objects

of interest have been ignored by this hit-and-miss process? Might it not be that entire areas of interest have been overlooked? Perhaps not; perhaps no harm has been done; and again perhaps therein lies our greatest shortcoming.

A fact that holds for all psychological tests must not be over-looked in this particular field: norms are not set once and irrevocably for all populations on earth. For use in Canada, the norms of American-made tests almost necessarily require revision. For instance, a few attempts at measurement with Kuder's *Preference Record* in Ottawa have convinced the users that the population of the Canadian national capital refuses to feel and prefer in amounts and doses predetermined by Kuder's set of norms. A revision is in order, even for the English version. And should our bilingual community require a French text, the corollary seems inescapable: new norms must be determined. Experience substantiates this. Professor Shevenell, who is well known, especially in French-speaking circles, for having translated and readapted several tests for use with French Canadian pupils, finds that readjustment procedures frequently require changes in content and in form, to say nothing of the entire process of standardization and subsequent readjustments. From this, it would seem preferable to forego the foreign paradigm, and start from scratch to build a test to one's own liking.

A word was said earlier about the tendency of research workers to follow the beaten path. This holds to some extent even in the measurement of interests. Are the handful of techniques earlier described the only ones possible? Most definitely not. Some writers suggest other approaches; here are some of them.[34] (1) The number of significant items of interest could be determined for each individual to measure the *extent* of his interests. (2) A scale could be constructed, the steps of which would mark ascending degrees of *universality* of interests. (3) *Aversions* could be surveyed, possibly with different results. (4) *Memory* for items recalled from the presentation of occupational motion pictures could be rated. Incidentally, Super and Roper did use this procedure: it still requires standardization.[35] (5) Moore suggests other lines of investigation: (a) length of time an absorbing interest has been maintained; (b) the accomplishments such an interest has to its credit; (c) the sacrifices for which it has been responsible; (d) the enthusiasm it has awakened; (e) the goals it has enabled a person to attain.[36]

In conclusion, a word on research. Despite what has already been accomplished in this field, there is still much to be done. Re-standardization of existing instruments is a huge task in itself. A conference was held in Atlantic City in 1930 specifically upon "The Measurement of Interests." As a result of this, a research committee was appointed, composed of Cowdery, Fryer, Kitson, Paterson, Strong, and Uhrbrock. Their report described over fifty topics for investigation. A list of the major research projects might still be a challenge to some of our Canadian psychologists. The list is quoted from Fryer's book, *The Measurement of Interests*.[37] (1)

A comparative study of objective and subjective measures. (2) A revision of the interest inventories to include all possible interests and aversions which are group-differentiating items. (3) The development of occupational information tests of interest. (4) The development of educational scoring keys of interest. (5) A trial of objective experimental devices to measure interests, such as, (a) the distraction technique; (b) the recall of items out of a motion picture presentation; (c) the use of nonsense materials, such as ink blots, syllables, figures; (d) the measurement of slight involuntary movements during the presentation of interests; (e) the measures of physiological processes. (6) A trial of various experimental devices for improvement of the subjective estimate of interests (various suggestions are given). (7) A trial of scoring keys for various special groups: racial, national, avocational, abnormal, secret, religious, etc. (8) Further development of Strong's scoring keys. (9) Further development of Wyman's Free Association technique to include occupational and educational scoring keys. (10) Investigation of universal subjective interests. (11) The development of rating scales of group interests. (12) The further study of permanence of subjective interests. (13) An investigation of the effect of instruction on interests. (14) The establishment of norms of development of interests.

Such is the size of the job that is still to be done. The encouraging amount of progress already accomplished is a healthy sign of vitality and a promise of future advancement. Thanks to the industry and tenacity of the research worker, the personnel consultant may soon have ways and means of determining rather adequately a person's pattern of interests.

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THE ROLE OF A PSYCHOLOGIST AND THE USE OF TESTS IN A JEWISH VOCATIONAL SERVICE[1]

NORMAN A. STACK
Jewish Vocational Service of Toronto

THIS paper will attempt to describe what is generally considered to be the accepted role of a psychologist and the way in which tests are used in a typical Jewish Vocational Service programme. The meaning of the word "typical" as used here should be clarified. Actually there is no typical programme since each of the twenty-odd J.V.S.'s located in the United States and Canada[2] differ from each other in many respects. In terms of agency size, budget, clientele, and philosophy, wide variations exist. Nevertheless, there is a close coordination and exchange of views taking place through the medium of the Jewish Occupational Council which serves as a clearing and coordinating body for the local J.V.S. agencies. In other words, typical, as used here, is meant to represent the consensus of thinking and practice followed by the individual Jewish Vocational Service.[3]

Although psychological service is associated with both the counselling and job-placement functions of a J.V.S. (tests are administered to people not requiring guidance, as clerical workers who may be given typing and shorthand proficiency tests), in this paper the discussion will be confined to its use in the counselling process.

In the typical agency there is a psychologist or psychology department, consisting of one or more people trained in the administration, scoring, and interpretation of tests. This department is regarded as a resource available to the counsellor when such service seems necessary. This means that tests, along with the other services provided by the psychologist, are not utilized in every counselling situation. Exact figures are not available, but a fair estimate would be that about 35 per cent of clients being counselled, are tested. Among the reasons for this figure, which to some may seem low, are:

(1) The counsellor either has available, or obtains, as much relevant data concerning the client as possible. This consists of such information as school grades, results of tests previously given, social and family background data, a record of previous work experience, etc. Frequently tests can add nothing significant to the particular problem presented and hence there is no need for them.

(2) Many clients cannot benefit from tests. One or more counselling

[1]Paper delivered at a meeting of the Toronto Psychological Association, March 3, 1948.

[2]In Canada the agencies are located in Montreal and Toronto.

[3]The procedures to be described are, of course, not unique to the Jewish Vocational Service Agencies. They are common to all good counselling programmes.

interviews are usually sufficient to focus the attention of the client on his real problem which may be one involving disturbing emotional relationships, for which case work or psychiatric assistance should be sought rather than counselling or testing service.

At this point it should be made clear that most, if not all, of the J.V.S. agencies limit themselves to dealing with clients who have problems in the area of vocational and/or educational adjustment. They do not attempt to offer psychotherapy. When a serious emotional problem is uncovered, the counsellor endeavours to help the client to see this problem clearly and to accept referral to a case-work or psychiatric agency equipped to deal with it. Consequently those who hold with this point of view believe that there is no place in the testing service of a vocational adjustment agency for projective methods of personality diagnosis (e.g. the Rorschach or the Thematic Apperception Test). The thinking is that most cases where such techniques are indicated should properly be referred for treatment to a psychiatrist or case worker. Nevertheless in special situations—borderline cases, for example—these methods are helpful and those agencies which have psychological staff trained in the administration and interpretation of projective techniques do utilize them in special situations.

At what point in the counselling process are tests used? There is no fixed answer to this question in terms of time (i.e. after the first or second or fifth interview) but there is an answer in terms of process. Tests should be administered only when it is clear to both the client and the counsellor that further progress toward a positive plan or the solution of a problem cannot be made without additional objective information such as tests can yield. In other words, counselling should focus attention (whether after one, two, or five interviews), on one or several specific areas requiring further exploration through tests. Occasionally no amount of counselling will serve to aid certain individuals in narrowing their choice—they maintain an attitude of general uncertainty and are unable to express any definite interest. Often they expect or request the counsellor to tell them what to do. In such situations, although it is doubtful that tests will provide any real solution, they may be requested by the counsellor for the purpose of furnishing leads for further discussion.

Assuming then, that the counsellor and client, through discussion, have reached the point at which it is clear that additional objective information (which can best be obtained through testing) is needed to proceed in formulating acceptable and suitable plans, the procedure usually followed is this: The counsellor arranges an appointment between the client and psychologist for tests to be administered. In most agencies the counsellor does not request specific tests but rather gives to the psychologist a brief statement of the nature of the problem presented and indicates in a general way some of the areas he would like to have explored. Frequently the counsellor may ask specific questions which he would like the psychologist

to answer, e.g. "Can this person do manual work requiring precision, accuracy, and finger dexterity such as might be done by a skilled watchmaker?" or "Could this person be successful as a salesman? Does he possess the type of personality necessary for this work?" In some agencies the practice differs—the counsellor suggests to the psychologist the tests that should be administered. Obviously the role of the psychologist is more meaningful and more significant in the former situation than in the latter where he is relegated to the position of psychometrician.

The next step is for the psychologist to transmit his findings back to the counsellor. This is usually done by means of a profile or percentile chart which gives the client's percentile ratings in terms of his own group norms as well as raw scores obtained. When specific questions are raised the psychologist attempts to answer them. Usually there is some comment on the client's behaviour during the test along with whatever other significant observations the psychologist was able to make. Those situations which are more involved may require a conference between the psychologist, counsellor, supervisor, or other staff members in a position to contribute to the planning based on the available data. Occasionally further testing is necessary when the situation has not been sufficiently clarified by the first test session.

Returning to the usual procedure—after the counsellor is provided with the test findings, it becomes his task to interpret the results to the client. The method of interpretation is probably the one phase of the total procedure which varies most. What is related to the counsellee depends on the situation, the skill of the counsellor, and the level of intelligence and understanding of the counsellee. Knowledge of test results may be of real value to one individual; the same information may serve as a disturbing force to another person. What information concerning test results should be given to parents? Schools? Social Agencies? These are difficult questions, the answers to which are fraught with danger. Test results contained in written reports have a degree of permanence which we know is not necessarily true of individuals who, as dynamic beings, may fluctuate by wide margins in their performance on the same test given at different times. Furthermore, it is often not possible to know very much of what background and knowledge the person or persons receiving such a report bring to it. A great deal of room for misinterpretation exists which may prove harmful to the individual about whom we are concerned. Consequently no universal principle can be applied to every situation. Each situation must be evaluated separately, on its own merits.

It is not intended to give the impression that the procedures described above are the only ones to be followed. As has been indicated, the various J.V.S. agencies themselves differ in many ways in regard to the use made of psychological techniques. There is room, and even need, for vigorous differences in points of view. One illustration of a relatively recent point of

view concerning the value of tests in counselling is provided by followers[4] of Carl Rogers' non-directive approach. They assert that tests have limited value inasmuch as the counsellee accepts only those results—good or bad, positive or negative—which he can integrate into his own conception of his Self. Certainly, there is some validity in this point of view. It should serve to stimulate thought and research about the entire question of the interpretation of test data.

Without pretending to say the last word, then, an attempt has been made to describe what seems to be the commonly accepted role of a psychologist and the way in which tests are used in a "typical" Jewish Vocational Service.

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IMPRESSIONS OF PSYCHOLOGY IN ENGLAND

ERNEST G. POSER
University of New Brunswick

THROUGHOUT the war years relatively little information reached this country concerning the activity of psychologists in England, and on the continent of Europe. Even since the end of the war international liaison between professional groups has been slow to recover and is only now gradually widening its scope. In communicating some of the observations made during the summer of 1947 spent in England the writer, therefore, hopes to contribute to the fuller collaboration desired by psychologists on both sides of the Atlantic.

UNIVERSITY OF LONDON

At University College, London, my contact with the Department of Psychology was made through a member of the Eugenics Department who had done extensive psychological work in Canada during the war. He was the first of many university people I met during this tour who were keenly interested in the activities of Canadian psychologists, an interest by no means restricted to those who had themselves been professionally active in this country.

The site of the Psychology Department testifies to the general space shortage resulting from the extensive war damage suffered by the University. Although there are only about seventy students enrolled in the Department at University College, the available facilities are inadequate from the instructors' point of view. Laboratory and classroom space is very limited, office space quite drastically rationed.

Relative to the total registration—the number of post-graduate students is high. Their work is supervised by Professor Sir Cyril Burt who is both Head of the Department and Director of Post-graduate Studies for the College. It would seem that the range of undergraduate courses corresponds roughly to those in this country, except that there is probably greater stress on experimental and less on clinical methods. At the graduate level the focus of attention is primarily on the statistical approach with emphasis on factor analysis.

Clinical tests and projective techniques are handled with much reserve. Perhaps the lack of a recognized clinical training centre, until very recently, may be held to account for the scepticism with which these methods are viewed in university circles. There are, however, at least two M.A. theses currently being written on aspects of the Rorschach technique, both by students undergoing their training analysis at present.

THE MAUDSLEY HOSPITAL

Whereas the department at University College concentrates its teaching on the purely academic aspects of psychology, there are in London centres

for Applied and Clinical Psychology co-operating or affiliated with the University. The Institute of Psychiatry at the Maudsley Hospital is a case in point. This modern hospital, with its very active psychological department under the direction of Dr. H. J. Eysenck, functions mainly as an out-patients' clinic but is also equipped to handle a limited number of resident patients for observation and treatment. During the war Dr. Eysenck was on the staff of the Mill Hill Emergency Hospital, a wartime neurosis centre which, together with Sutton Emergency Hospital, took over the work of the Maudsley Hospital for the duration. The investigations carried out at Mill Hill are fully described in Dr. Eysenck's book, *Dimensions of Personality*,[1] and constitute an impressive record of the way in which collaboration in research by a team of psychologists and psychiatrists can contribute to the study of personality.

At present Dr. Eysenck, apart from directing the psychological department at the Maudsley, is inaugurating a post-graduate training programme for clinical psychologists. This course, which requires full-time attendance during one year, is designed to prepare candidates for the Academic Post-graduate Diploma in Psychology of the University of London. The training consists of lectures, practical work, seminars, case conferences, and visits to institutions, the object being to fit the student to carry out competently the functions of a psychologist in the field of applied, and in particular, of educational and clinical psychology. This course was scheduled to begin in October 1947.

Much of the work at the Maudsley involves child guidance. Case conferences are presided over by psychiatrists belonging to various schools of thought and decisions are made in the light of reports by the psychologist, social worker, and medical intern in charge. The cases are often in the nature of maladjustments ascribable to the changes and privations encountered by young children during long periods of evacuation from their homes.

Tavistock Clinic

Another centre of psychological activity, not connected with the University however, is the Tavistock Clinic. This organization was founded in 1920 to provide psychological help and guidance for adults and children who experience difficulties of adjustment. In recent years, following the experience gained by army psychiatrists and psychologists, the clinic has been reorganized and presently comprises (a) a child guidance unit and training centre; (b) an adult consultation, counselling and treatment service; and (c) the Tavistock Institute of Human Relations, established with the help of a grant from the Rockefeller Foundation. A wide range of diagnostic tests involving the most modern techniques are used by psy-

[1]London: Kegan Paul, 1947.

chologists at this clinic. In the research programme there is at present strong emphasis on group techniques along the lines investigated in the United States. A quarterly Journal edited jointly by the Tavistock Institute and the Research Centre for Group Dynamics at Massachusetts Institute of Technology first appeared in May, 1947. The Clinic is also promoting a programme of study and training for psychologists and psychiatrists, and works in close co-operation with the London Institute of Psycho-Analysis.

The Institute of Psycho-Analysis

That Institute is a very busy place at present with far more applicants than facilities for training. Technically, lay persons with a university degree, or its equivalent, who have suitable experience, are eligible for training, but at present so many applications by medically qualified candidates are on hand that prospective lay-analysts are at a disadvantage.

National Institute of Industrial Psychology

Applied psychology in England has its headquarters at the National Institute of Industrial Psychology, founded in 1921. During the war both the Royal Navy and the British Army found in the Institute's scientific staff a reserve of trained personnel on which they drew heavily for technical knowledge. The Institute operates on a non-profit-making basis, and, apart from investigating specific problems in industry, offers vocational guidance, lectures, a library and information service, as well as education and training in industrial psychology. Problems of wider importance are made the subject of research so far as resources permit and a monthly News Bulletin, *N.I.I.P.*, appears, in addition to a quarterly journal, *Occupational Psychology*.

There are, of course, in England and in London many other groups and organizations concerned with psychology, particularly in the field of education. There is the vast sphere of experimental psychology at Cambridge; there is the work done in the smaller departments of the northern universities; there is the Society for Psychical Research. It has not been my good fortune to visit all these places, but I hope that the report on what I did see will give some indication of the rapid development characteristic of post-war psychology in England.

INTERNATIONAL CONGRESS ON MENTAL HEALTH

London, England, August 11-21, 1948

A CONGRESS has been called for the above dates in London, England. It will consist of three International Conferences:

1. *Child Psychiatry.* (Theme: Personality development in its individual and social aspects with special reference to aggression.)
2. *Medical Psychotherapy.* (Theme: Guilt.)

The above two Conferences will run concurrently from August 11 to 14.

3. *Mental Hygiene.* (Theme: Mental Health and World Citizenship.)

The last mentioned Conference will form the major part of the programme. The following subdivisions of the general theme will be the main topics on consecutive days: (a) Problems of world citizenship and good group relations; (b) The individual and society; (c) Family problems and psychological disturbances; (d) Planning for mental health; organization, training, propaganda; (e) Mental health in industry and industrial relations; (f) Concluding session and summaries.

This Conference is sponsored by the International Committee for Mental Hygiene, New York, and by the National Committee for Mental Hygiene (Canada). Membership is open to trained workers in mental health and related fields, and to members of recognized organizations which are connected with such work. This includes applicants in the following categories: (1) members of professional associations in psychiatry, psychology, social work, sociology, anthropology; (2) members of the medical profession, the teaching profession (including nursery school teachers), the nursing profession, and the clergy; (3) members of Preparatory Commissions working for the Conference; (4) individuals with special competence, special experience, or special interest in the field of mental hygiene.

A total membership of at least 2,000 is expected, coming from North and South America, Asia, Western Europe, and the Eastern European countries of Bulgaria, Roumania, Hungary, and Czechoslovakia; an estimated 500 are expected from the United States and Canada. At present, about a dozen discussion groups are at work throughout Canada on various aspects of the Conference's main topics. Their reports will be collated and integrated as the Canadian contribution. Each province has a Provincial Chairman whose name may be obtained from the National Committee for Mental Hygiene (Canada), 111 St. George Street, Toronto, Ontario. Fifty additional groups are at work in other countries.

Financial support from private companies and foundations in the United States and in Britain, totalling $100,000, has been received to date. Further funds are urgently needed to carry through a congress of this scope and magnitude and a campaign has been started to raise an additional $200,000 in the United States. The campaign has been organized in Can-

ada, but contributions from individuals or groups will be most gratefully received. Suggestions as to sources of contributions would be most welcome and should be sent to the National Committee for Mental Hygiene (Canada) clearly marked for this purpose.

John R. Rees, C.B.E., M.D., F.R.C.P., of London (who was chief psychiatric consultant to the British Army) is President of the Congress. It has the support of UNESCO and the World Health Organization of the United Nations. It is proposed to form a continuing organization out of the Congress to be known as the World Federation for Mental Health. This would become the official voluntary consultative agency in the field of mental health for UNESCO and the World Health Organization.

BOOK REVIEWS

The Psychology of Rumor. By GORDON W. ALLPORT and LEO POSTMAN. New York: Henry Holt and Company. 1947. Pp. xiv, 247. $3.00.

ALTHOUGH rumors have been a constant feature of human communication in all ages, this is the first systematic attempt by psychologists to explain what they mean and why they circulate. The reason is probably that in relatively stable periods they seem too commonplace and trivial to deserve serious attention. At times of uncertainty or crisis, however—in wars, panics, epidemics, riots—rumors assume great social importance and may play a decisive part in determining the behaviour of the publics affected. Living as we do in what seems a relatively permanent crisis, we should be grateful to Professor Allport and his colleague for expanding their earlier work on the subject[1] into this interesting, lucid, and comprehensive book.

The scope is wider than might be expected, for it turns out that rumor is merely a special case of the drives and distortions which affect most human perception and communication. On the descriptive side, for instance, Bartlett's findings on changes in remembered material are directly relevant, and his method of serial reproduction was adapted by the authors for the experiments which make up a third of the book. From these emerge three characteristic types of distortion in orally transmitted material, called *levelling, sharpening,* and *assimilation;* essentially the same three are found, not only in Bartlett's work, but in quoted findings by Gestalt and other psychologists.

On the dynamic, motivational side, the authors insist first on the "effort after meaning" which underlies man's perceptual approach to any rationalization—again a three-fold interpretation, and one which they apply with after meaning" which underlies man's perceptual approach to any situation, and then employ the concepts of emotional projection and rationalization—again a three-fold interpretation, and one which they apply with admirable insight to the analysis of case material in the form of actual rumors. The abundance of such concrete material, drawn from Allport's wartime connection with the Boston "Rumor Clinic" and other agencies, makes the treatment vivid and interesting throughout, in spite of its rigorous and closely reasoned character.

During periods of emergency many public officials are actively concerned with the prevention and control of rumor. Such persons will find in the present volume all they need to know about the phenomenon and many practical suggestions for dealing with it. Of particular interest in this connection is the emphasis on rumor as an index of the public's state

[1] "The Basic Psychology of Rumor" (*Transactions of the New York Academy of Sciences,* Series II, 8, 61-81).

of mind, a dependable advance warning of such disturbances as race riots. The latter, as the authors make clear, never occur without a preliminary barrage of rumors; closer attention to these would permit counter-measures to be taken before the trouble begins.

To the academic psychologist the chief interest of *The Psychology of Rumor* will probably lie in its tying together of a variety of important researches which are sometimes neglected in present-day courses. Stern's *Aussage,* Bartlett's remembering, the *Prägnanz* of the Gestaltist, and many Freudian concepts are woven into a meaningful whole and applied with skill and scholarship to a familiar phenomenon. While the authors call the volume a text-book, it is well worth reading in its own right, and would also be a valuable additional reference in many social psychology courses. It contains a bibliography, index, a set of standards for agencies dealing with rumors, and a number of illustrations.

J. D. KETCHUM

University of Toronto

Training in Clinical Psychology: Transactions of the First Conference March 27-28, 1947. New York: Josiah Macy, Jr. Foundation. 1947.

THIS is a symposium of papers read at the first Josiah Macy, Jr. Foundation Conference on Training in Clinical Psychology. The Conference, under the chairmanship of Dr. Lawrence S. Kubie, was addressed by twelve psychiatrists and psychologists, all authorities in their respective fields. The *Transactions* are an invaluable source of information and opinion for all those who are interested in the training of clinical psychologists. It is impossible to review adequately in a small space so varied a collection of papers; it may be well, however, in view of the current preoccupation of the Canadian Psychological Association with training and certification, to list the papers with their authors. The paper by Dr. Molly R. Harrower was published in the March, 1948 issue of the *Canadian Journal of Psychology.*

"The Evolution of a Clinical Psychologist"—Molly R. Harrower

"Preclinical Training of the Clinical Psychologist"—Carlyle Jacobsen

"Training for the Clinical Application of Test Techniques"—David Shakow

"The Training and Functions of a Psychiatric Social Worker in a Clinical Setting"—Ethel L. Ginsburg

"Elements in the Medical Curriculum Which Should Be Incorporated in the Training of the Clinical Psychologist"—James G. Miller

"Elements in the Medical Curriculum Which are Essential in the Training for Psychotherapy"—Lawrence S. Kubie

"The Role of Training in Clinical Psychology in General Medical Education"—Henry W. Brosin

"The Role of Training in Clinical Psychology in the Education of the Psychiatrist"—Carl Binger

"Training in Psychoanalysis and the Development of Theoretical Concepts of Clinical Psychology"—Ernst Kris

"The Role of Training in Psychoanalysis in the Development of Research in Clinical

Psychology"—Rene A. Spitz
"The Role of Training in Psychoanalysis for the Development of Therapeutic Techniques in Clinical Psychology"—Margaret Brenman
"Primary Facilities in Psychoanalytic Psychiatry"—Ives Hendrick

Problems of Early Infancy: Transactions of the First Conference, March 3-4, 1947. New York: Josiah Macy, Jr. Foundation. 1947.

THIS is a symposium of papers presented under the auspices of the Josiah Macy, Jr. Foundation of the first conference on problems of early infancy. The central theme running through these papers is the importance of an indulgent and consistently affectionate care by the mother of the new-born child. Six of the twelve papers are devoted directly to "Rooming-In." "Rooming-In" refers to the practice of having the child remain with the mother from the moment of his birth, instead of having him segregated as is the normal practice in maternity hospitals. The "Rooming-In" plan encourages the father and other relatives to enter into the new family associations more fully than is possible when mother and child occupy separate quarters. The tone of the papers tends to be strongly psychoanalytical.

JOHN A. LONG

Ontario College of Education

BRITISH COLUMBIA PSYCHOLOGICAL ASSOCIATION

DURING the past year and a half the British Columbia Psychological Association has made considerable progress in reconsolidating its membership following the disrupting years of the war. As of the end of April, 1948, the membership stood at forty-five, comprised of psychologists, psychiatrists, social workers, teachers, and others interested in problems of a psychological nature.

Reflecting a feeling that the psychologists should occupy a position of some pre-eminence in the Association, the members passed an amendment to the constitution at the March, 1948 meeting, which provides for two classes of membership, Fellows and Members. Applicants for the status of Fellow are to be elected upon the recommendation of a Board of Selection. It is expected that this amendment will facilitate the activities of the Association where the professional status of psychologists is being considered.

Monthly meetings of the Association have been held, most of them in the Psychology Laboratory of the University of British Columbia. Members and guest speakers have presented papers on such diverse topics as Alcoholics Anonymous, projective techniques, units of measurement for the psychogalvanic response, discipline in adolescence, art as an expression of modern man, and the International Congress on Mental Health. Meetings have been well attended, and active discussion has followed each paper. A valuable result of the inclusion of various professions other than psychology in the membership has been the diversity of points of view brought to bear in the discussion of these topics.

In April, 1947 the British Columbia Academy of Sciences, with which the Association is affiliated, held its first conference of scientific societies. The B.C.P.A. participated with a full day's programme of papers presented to a "Psychology Section." This section was attended both by members of the Association and by delegates to the conference representing other scientific disciplines. In addition, the B.C.P.A. held a luncheon meeting of its own members, and was addressed by Professor S.N.F. Chant.

A second conference of the Academy was held this year for two days, April 16 and 17. Six papers were presented in two sessions of the Psychology Section: W. G. Black, "Developments in Testing and Counselling at the University of British Columbia Veterans Bureau"; E. S. W. Belyea, "Psychology as a Profession in Canada"; D. C. G. MacKay, "The Psychology of the Crab"; J. E. Morsh, "Psychological Research in British Columbia"; B. Savery, "Ethics as Psychology Rather Than Philosophy"; and F. T. Tyler, "Individual Differences in Mirror Image Learning." Mr. Robert Straight of the Bureau of Measurements of the Vancouver School Board addressed a luncheon meeting of the Association members, and in a general session of the Conference Mr. Dean Goard presented one of the five papers in a symposium on Natural Resources in British Columbia, entitled "Hu-

man Resources, Vocational Training in the Lower Mainland." It is expected that texts of all papers presented at the conference will be made available for limited distribution in mimeographed form by the British Columbia Academy of Sciences.

The present executive of the B.C.P.A., elected in January for the calendar year 1948, is as follows: *Past President,* Marianne R. Lourie; *President,* W. G. Black, Students' Advisory Service, U.B.C.; *Vice-President,* E. S. W. Belyea, Department of Philosophy and Psychology, U.B.C.; *Corresponding Secretary,* J. E. Morsh, Department of Philosophy and Psychology, U.B.C.; *Recording Secretary,* Mrs. E. Winn, Department of Extension, U.B.C.; and *Treasurer,* Mrs. E. Bene, Graduate Student in Psychology, U.B.C.

PROCEEDINGS OF THE ANNUAL MEETING OF THE ONTARIO PSYCHOLOGICAL ASSOCIATION

Toronto, January 30 and 31, 1948

THE Second Annual Meeting of the Ontario Psychological Association was held in the Royal York Hotel, Toronto, on January 30 and 31, 1948. There were 78 persons registered.

CERTIFICATION

The opening meeting on Friday afternoon consisted of a panel discussion on certification, which took as its point of departure the previously distributed report of the Committee on Certification. The panel consisted of: Dr. G. H. Turner (Chairman), Dr. W. E. Blatz, Miss M. G. LeBas, and Dr. R. B. McLeod. In addition to points of view expressed by members of the panel, there was discussion from the floor.

PSYCHOLOGY AS A PROFESSION

On Friday evening an audience of about 150 was addressed by Dr. Dael Wolfe, Executive Secretary of the American Psychological Association on the subject of "Psychology as a Profession." Dr. W. E. Blatz was chairman and introduced the speaker.

BUSINESS SESSION

A business meeting, with the President, Dr. C. R. Myers, as Chairman, opened the Saturday morning session.

1. The financial statement was tabled. It was moved and seconded that it be adopted. Carried.

2. On reading of the secretary's report, it was moved and seconded that it be adopted. Carried.

3. A proposed revision of the constitution was introduced by the Vice-President, Dr. Leola E. Neal, who pointed out that notice of motion had been duly circulated to members. She moved that the revised constitution be adopted. It was seconded by Dr. G. H. Turner. Carried.

4. It was moved and seconded that the executive of the Association take whatever steps are necesary to obtain a provincial charter. Carried.

5. It was moved and seconded that the secretary be authorized to impart, on request, such information as he possesses regarding the training and experience of members and associate members, but that he may not give any evaluation of the individual whatsoever. Carried.

TRAINING OF PSYCHOLOGISTS

A panel discussion on "The Training of Psychologists in Ontario" occupied the latter half of the Saturday morning session. Members of the panel were: Dr. K. S. Bernhardt (Chairman), Dr. H. M. Estall, Prof. R. H. Shevenell, and Prof. Mary J. Wright. Copies of the report of the Committee

on Training were distributed and the subject was discussed from the floor as well as by members of the panel.

Luncheon Meeting

At a luncheon meeting the result of the election of the executive for the ensuing year was announced, as follows: *President,* Dr. Leola E. Neal; *Vice-President,* Dr. N. W. Morton; and *Secretary-Treasurer,* Mr. J. B. Boyd.

Representatives of local associations were called upon to speak briefly on behalf of their organizations. The groups represented were as follows: The University of Western Ontario Psychology Club, by Prof. Mary Wright; The University of Toronto Psychology Club, by Miss Mary Lawrence; The Queen's Psychology Club, by Mr. D. S. Conger; and The Toronto Psychological Association, by Dr. Kenneth Rogers.

The meeting was then addressed by Dr. L. S. Tsai, Director of the Psychological Institute at Sun-Yat-Sen University. His subject was "The Psychology of Chinese Characters."

Psychological Research in Ontario

The Saturday afternoon session opened with a panel discussion of "Psychological Research in Ontario." The Panel consisted of: Dr. W. Line (Chairman), Miss D. M. Beattie, Dr. N. W. Morton, Dr. C. R. Myers, and Miss Reva Potashin. The approaches being made in various settings were outlined by panel members with discussion of the subject by others present.

Predicting the Behaviour of Individuals

An address by Dr. Donald Snygg of the Psychological Clinic, State Teachers College, Oswego, New York, concluded the meeting. Dr. Snygg's subject was "Predicting the Behaviour of Individuals." Dr. C. R. Myers was in the chair and the speaker was introduced by Dr. W. Line.

J. B. Boyd
Secretary-Treasurer